

## Eye On Drought

*Produced by the Monitoring  
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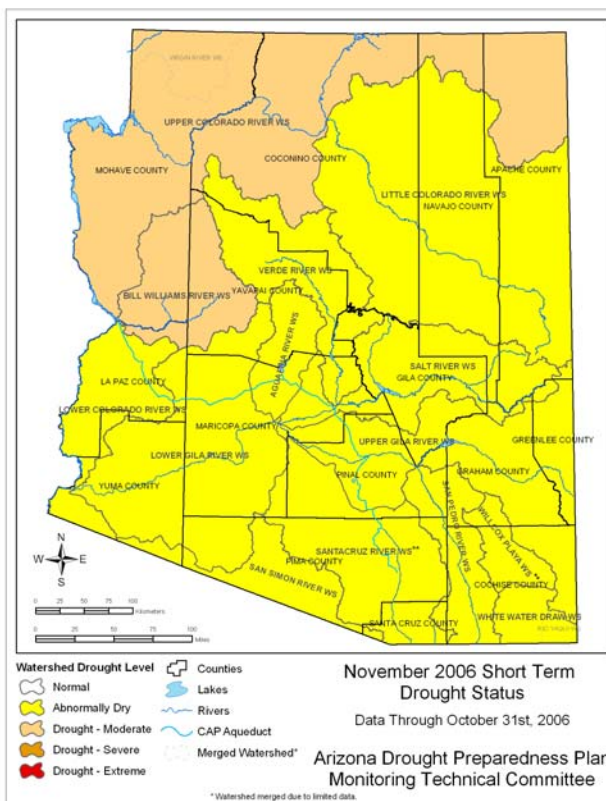
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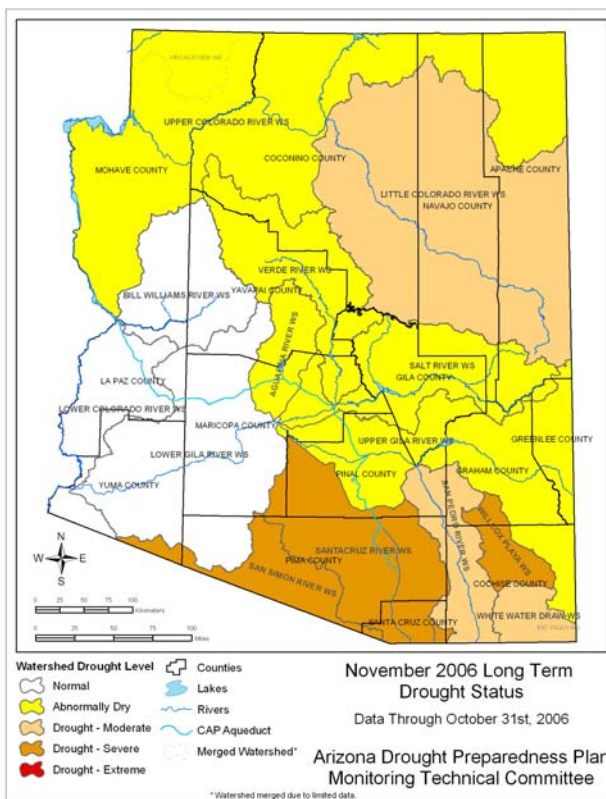


# Arizona Drought Monitor Report November 2006



## Short-term Drought Status

The short-term drought status remains unchanged from the previous update, as October precipitation was near or above average across most of the state. The wet monsoon in the southeast stimulated vegetation growth on pastures and rangeland for the short-term, but most basins remain at the abnormally dry level. The October rains in the northwest were insufficient to bring the Bill Williams, Upper Colorado and Virgin River basins out of the moderate drought condition.



## Long-term Drought Status

The southwest and west central basins remain normal, while the east central and eastern watersheds have moved up either from severe to moderate drought or from moderate to abnormally dry. The south central basins remain in severe drought. If the moderate El Niño forecast for the winter of 2006-2007 brings significant above-average precipitation, the trend toward improvement should continue.



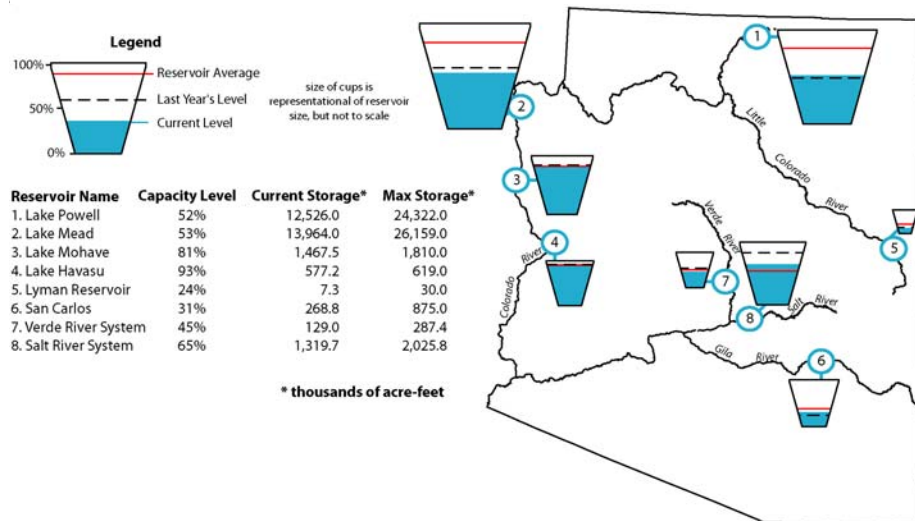
# Reservoir Storage



## Arizona Reservoir Status

During October 2006, the Four Corners region received substantial and locally intense precipitation. According to Tom Ryan of the U.S. Bureau of Reclamation, these downpours resulted in record-breaking daily flows on Colorado River tributaries and unprecedented increases in the elevation of Lake Powell during October. Lake Powell storage rarely increases during October. Since last month, the combined storage in Lake Powell and Lake Mead increased 1 percent. Some of the smaller interior Arizona reservoirs also logged increases during the last month; however, storage in the Salt and Verde river basin systems declined by several percent. During this time of year, storage usually declines until replenished by winter precipitation and spring snowmelt. (Data provided by USDA-NRCS, graphic below provided by University of Arizona - CLIMAS (Climate Assessment for the Southwest))

Arizona reservoir levels for October 2006 as a percent of capacity. The map depicts the average level and last year's storage for each reservoir, while the table also lists current and maximum storage levels.

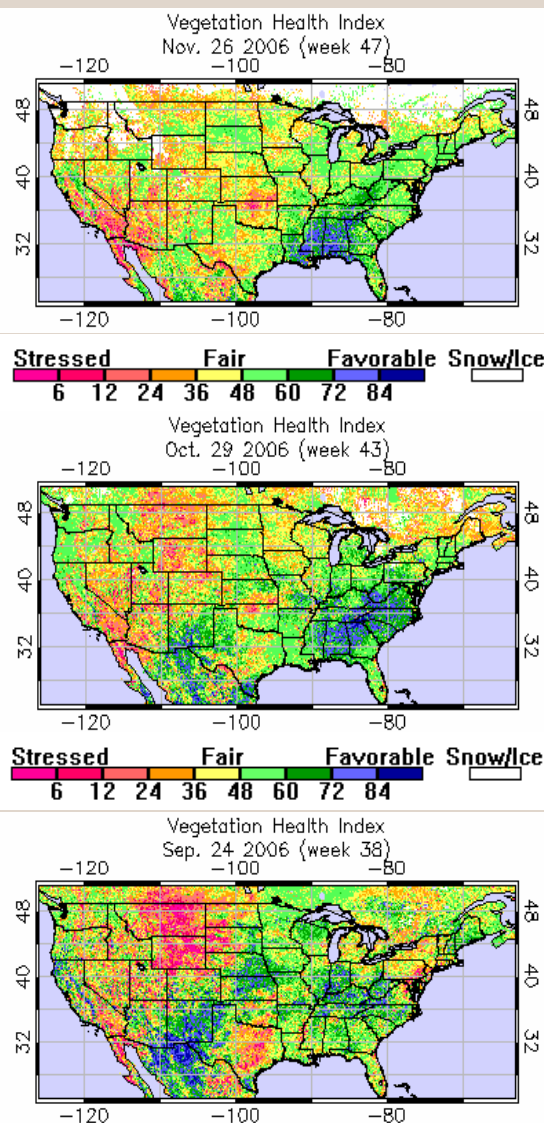


# Vegetation Health



Vegetation conditions have deteriorated throughout most of the state since late October due to recent drier-than-average conditions during this normally dry part of the year. Through the upcoming winter, increased chances for above-average precipitation related to the current El Niño are predicted by the NOAA-CPC, which could lead to improvements in vegetation health.

Satellite-derived images from the NOAA National Environmental Satellite, Data and Information Service (NESDIS) were taken November 26 (top figure), October 29 (middle) and Sept. 24, 2006 (bottom).

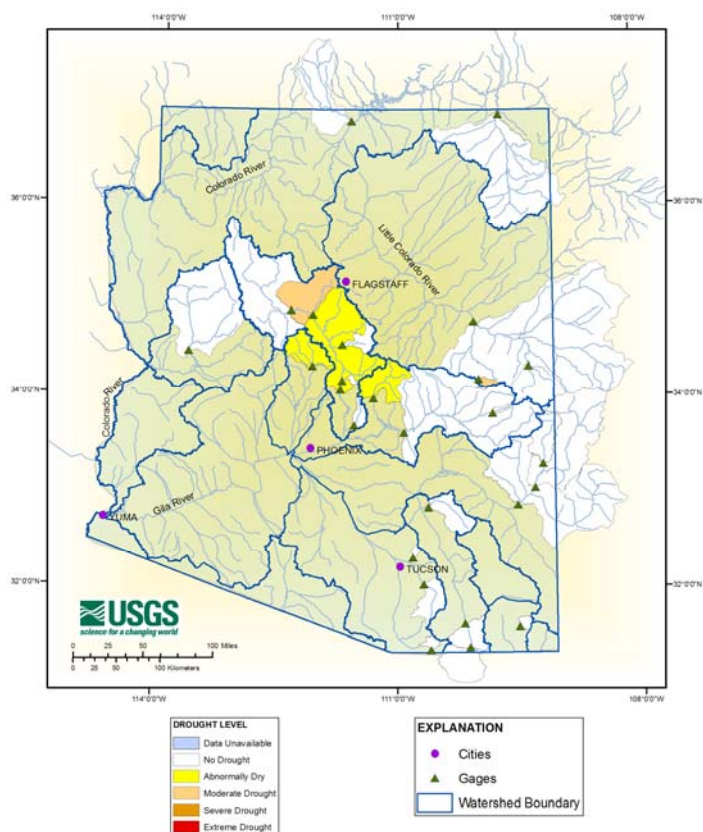


# Mountain Streamflow and Precipitation



## Drought Levels Based on Monthly Streamflow Discharge

October 2006



## October Streamflow

Going into the new water year, runoff for major streams in Arizona was generally near median to above median, although the Little Colorado River above Lyman Lake, and Tonto Creek, had below median runoff in October.

October Streamflow Observed (compiled by NRCS from USGS data)

| Water body   | October Runoff in Acre Feet | % of Median |
|--|-----------------------------|-------------|
| Salt River near Roosevelt                                    | 19,865                      | 145%        |
| Tonto Creek above Gun Ck. nr. Roosevelt                      | 780                         | 79%         |
| Verde River at Horseshoe Dam                                 | 12,988                      | 95%         |
| Combined Inflow to Salt River Project (SRP) reservoir system | 33,633                      | 120%        |
| Little Colorado River above Lyman Lake                       | 235                         | 78%         |
| Gila River to San Carlos Reservoir                           | 31,360                      | 482%        |

## Mountain Precipitation

### October Precipitation -

Climate data from high elevation monitoring stations show that precipitation for October 2006 was 127 percent of average over the Salt River basin, 109 percent of average over the Verde River basin, and 137 percent of average over the San Francisco-Upper Gila River basin. The Little Colorado River basin received 117 percent of average precipitation in October.

### Water Year Precipitation -

Cumulative precipitation for the water year is off to a good start with all basins reporting above average precipitation for October, ranging from 109 to 137 percent of average (see table at right).

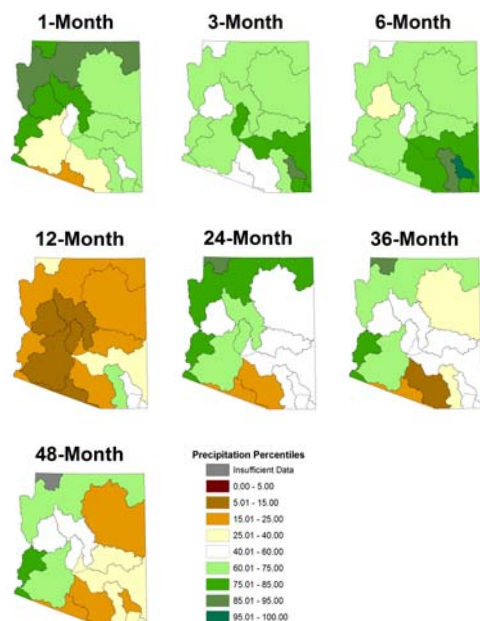
| Watershed                            | Percent (%) of 30-Yr. Average Water Year Precipitation October 1 – October 31 |
|--------------------------------------|---|
| Salt River Basin                     | 127%  |
| Verde River Basin                    | 109%  |
| Little Colorado River Basin          | 117%  |
| San Francisco-Upper Gila River Basin | 137%  |
| Central Mogollon Rim                 | 115%  |



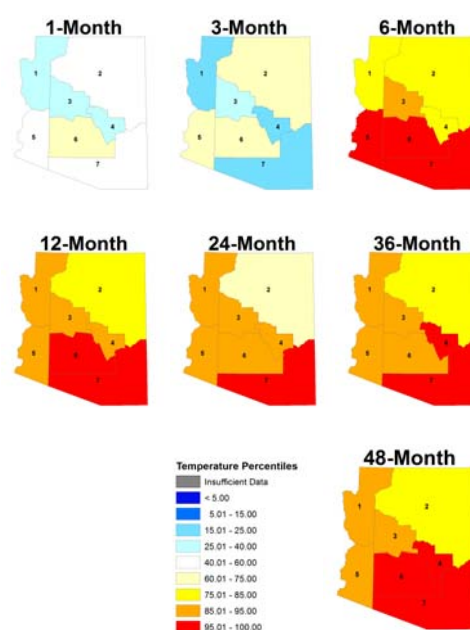
# Temperature and Precipitation



## Precipitation Percentiles by Watershed

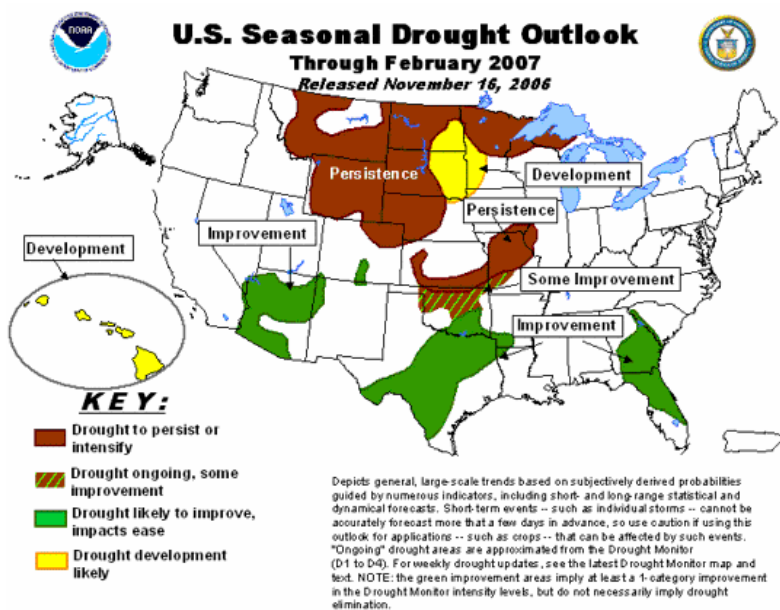


## Temperature Percentiles by Climate Division



| Time period         | Precipitation  | Temperature  |
|---------------------|--|--|
| One-month period    | <ul style="list-style-type: none"> <li>Northwest Arizona - above average</li> <li>Eastern half of state - average</li> <li>Southwest watersheds - below average</li> </ul>   | <ul style="list-style-type: none"> <li>Northwest - below average</li> <li>Northeast, southeast, and southwest - average</li> <li>Central climate division - slightly above average</li> </ul>  |
| Three-month period  | <ul style="list-style-type: none"> <li>Virgin, Bill Williams, Santa Cruz, and San Simon watersheds - average</li> <li>Above average everywhere else in the state</li> </ul>  | <ul style="list-style-type: none"> <li>Northwest and southeast - below average</li> <li>Northeast and southwest - above average</li> </ul>   |
| Six-month period    | <ul style="list-style-type: none"> <li>Above to well-above average over most of the state</li> <li>Bill Williams at the 33<sup>rd</sup> percentile</li> </ul>  | <ul style="list-style-type: none"> <li>Above the 75<sup>th</sup> percentile everywhere in the state</li> <li>Southern half of the state - above the 95<sup>th</sup> percentile</li> <li>Extreme temperatures generated an increased demand for the summer precipitation</li> </ul> |
| Twelve-month period | <ul style="list-style-type: none"> <li>12-month period is most graphic indicator of drought</li> <li>Below the 25<sup>th</sup> percentile for most of the state</li> <li>Many watersheds in the west central part of the state below the 15<sup>th</sup> percentile</li> </ul> | <ul style="list-style-type: none"> <li>Colorado Plateau - above the 75<sup>th</sup> percentile</li> <li>Southeast and south central areas - above the 95<sup>th</sup> percentile</li> <li>Above the 85<sup>th</sup> percentile in remainder of state</li> </ul>                    |
| Two-year period     | <ul style="list-style-type: none"> <li>Colorado and Virgin River watersheds - above the 75<sup>th</sup> percentile</li> <li>Santa Cruz and San Simon watersheds - at 21<sup>st</sup> percentile</li> <li>Remainder of state - near or slightly above average</li> </ul>        | <ul style="list-style-type: none"> <li>Colorado Plateau dropped down to the 72<sup>nd</sup> percentile</li> <li>Well above the 85<sup>th</sup> percentile everywhere else</li> </ul>   |
| Three-year period   | <ul style="list-style-type: none"> <li>Western half of the state - near or above-average</li> <li>Eastern half of the state - near or below-average</li> </ul>   | <ul style="list-style-type: none"> <li>Entire state still above the 75<sup>th</sup> percentile</li> <li>Portions of the southeast remain above the 95<sup>th</sup> percentile</li> </ul>   |
| Four-year period    | <ul style="list-style-type: none"> <li>Slight improvement, particularly in the southern half of the state</li> <li>Western watersheds - near or above-normal</li> <li>Eastern watersheds - near or below-normal</li> </ul>   | <ul style="list-style-type: none"> <li>Still above the 95<sup>th</sup> percentile in the southeast and south central climate divisions</li> <li>Remainder of state - above the 75<sup>th</sup> percentile</li> </ul>   |

# Weather Outlook



## Drought Outlook

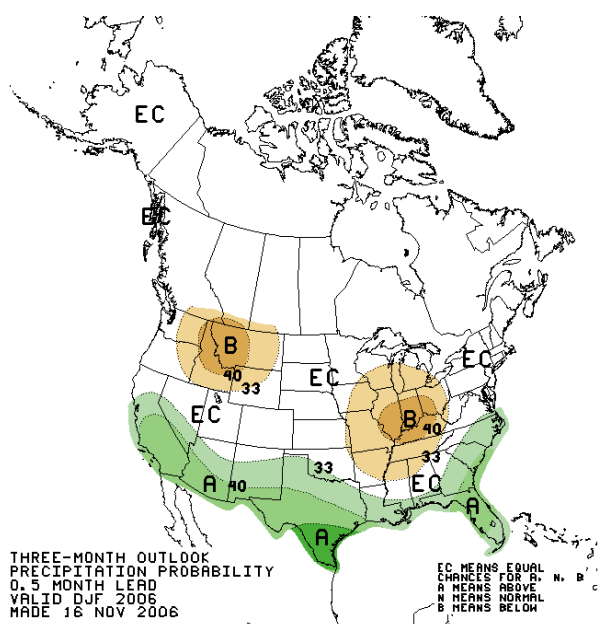
The Climate Prediction Center Seasonal Drought Outlook indicates virtually all of the state will see lessening of the drought impacts through February 2007. The developing El Niño event in the eastern Pacific Ocean is now considered to be a moderate El Niño episode. It is still a bit early to tell what impact this will have on Arizona's winter, but history shows that in similar situations, precipitation in Arizona showed a tendency to be above average, especially after February 1<sup>st</sup>.

Also see the most current Southwest Climate Outlook -

[www.ispe.arizona.edu/climas/forecasts/swoutlook.html](http://www.ispe.arizona.edu/climas/forecasts/swoutlook.html)

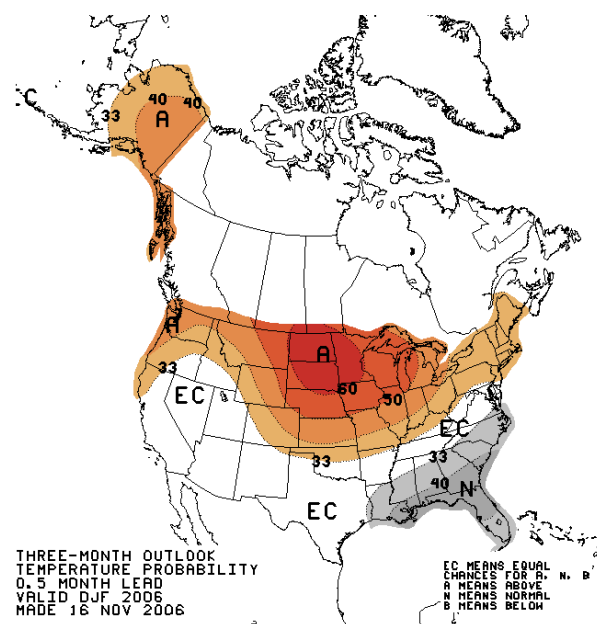
For additional weather information from the Office of the State Climatologist for Arizona -  
<http://geography.asu.edu/azclimate>

## December to February Weather Outlooks



### Precipitation

*Slight amount of confidence precipitation will be above average in the northern half of the state, and modest confidence precipitation will be above average in the southern half of the state*



### Temperature

*Equal chances for above average, average, and below average temperatures - a marked change from previous outlooks which indicated modest confidence for above average temperatures*

NOAA's CPC Outlooks are 3-category forecasts. As a starting point, the 1971–2000 climate record is divided into 3 categories, each with a 33.3 percent chance of occurring (i.e., equal chances, EC). The forecast indicates the likelihood of one of the extremes—above-average (A) or below-average (B)—with a corresponding adjustment to the other extreme category: the "average" category is preserved at 33.3 likelihood, unless the forecast is very strong. Thus, using the NOAA-CPC temperature (precipitation) outlooks, areas with light brown (green) shading display a 33.3–39.9 percent chance of above-average, a 33.3 percent chance of average, and a 26.7–33.3 percent chance of below-average temperature (precipitation). A shade darker indicates a higher than 40.0 percent chance of above-average, a 33.3 percent chance of average, and a further reduced chance of below-average temperature, and so on. Equal Chances (EC) indicates areas with an equal likelihood of above-average, average, or below-average conditions; it is used by forecasters when the forecast tools do not indicate a strong "signal" that conditions during a given period will be in any one of the three categories.